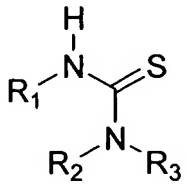
We claim:

1. A method for preventing, reducing, or otherwise treating hearing impairment due to noise-induced hearing loss (NIHL), aging, or chemical-induced hearing loss (CIHL), comprising administering to a subject a compound, or a pharmaceutically acceptable salt, tautomer, solvate, clathrate, prodrug or metabolic derivative thereof, having a structure according to Formula I:



Formula I

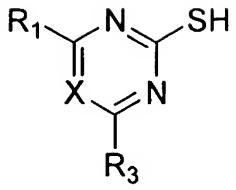
wherein, as valence and stability permit,

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

2. The method of claim 1, wherein R_1 and R_2, taken together form a substituted or unsubstituted aryl, a cycloalkyl, cycloalkenyl, heterocyclyl, polycyclyl, or cyclic metal complex.

3. The method of claim 1, wherein R_2 and R_3, taken together form a substituted or unsubstituted aryl, cycloalkyl, cycloalkenyl, heterocyclyl, polycyclyl, or cyclic metal complex.

4. A method for preventing, reducing, or otherwise treating hearing impairment due to NIHL, aging, or CIHL, comprising administering to a subject a compound having a structure of Formula II, or a pharmaceutically acceptable salt, tautomer, solvate, or clathrate thereof:



Formula II

wherein, as valence and stability permit,

X represents C-R_2;

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

5. The method of claim 4, wherein at least one of R_1, R_2, and R_3 represents a sulfhydryl or alkylthio group.

6. The method of claim 4, wherein

X represents a C-R_2; and

R_3 represents a hydroxyl.

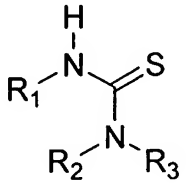
7. The method of claim 4, wherein X represents C-R_2 and at least one of R_1 or R_2 represents hydrogen.

8. The method of claim 4, wherein X represents C-R_2 and R_1 and R_2 represent lower straight-chained or branched C_1 to C_6 alkyls.

9. The method of claim 4, wherein X represents CH, R_1 represents H, and R_3 represents a propyl group.

10. The method of claim 4, wherein X represents C-R_2 and R_2 represents a carboxyl or a pharmaceutically acceptable derivative thereof.

11. A method for preventing or treating hearing impairment in a subject undergoing treatment with an ototoxic chemotherapeutic drug selected from an aminoglycoside antibiotic, a platinum-containing antineoplastic agent, certain quinine-like compounds or an ototoxic diuretic drug, comprising administering to the subject in need of such treatment a therapeutically effective amount of a compound represented by formula I:

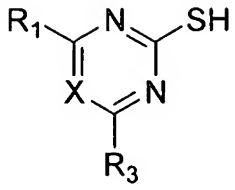


Formula I

wherein, as valence and stability permit,

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members; without reducing the chemotherapeutic drug's efficacy.

12. A method for preventing or treating hearing impairment in a subject undergoing treatment with an ototoxic chemotherapeutic drug selected from an aminoglycoside antibiotic, a platinum-containing antineoplastic agent, certain quinine-like compounds or an ototoxic diuretic drug, comprising administering to the subject in need of such treatment a therapeutically effective amount of a compound represented by formula II:



Formula II

wherein, as valence and stability permit,

X represents C-R_2;

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members; without reducing the chemotherapeutic drug's efficacy.

13. The method of any of claims 11-12, wherein said compound is administered prior to, simultaneously with, or subsequent to administration of said ototoxic chemotherapeutic drug.

14. The method of any of claims 11-12, wherein a therapeutically effective amount of the compound is administered with each dose of ototoxic chemotherapeutic agent, at specified intervals throughout the treatment course, or at the beginning of the treatment course.

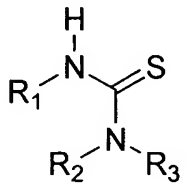
15. The method of any of claims 11-12, wherein a the compound is administered between 72 hours before and 36 hours after treatment with said ototoxic chemotherapeutic drug.

16. The method of any of claims 11-12, wherein the drug is an aminoglycoside antibiotic selected from amikacin (BB-K8), butirosin, geneticin, gentamicin, kanamycin, lividomycin, neomycin, paromomycin, hybrimycin, propikacin (UK 31214), ribostamycin, seldomycin, trehalosamine, α-D-mannosyl-α-D-glucosaminide, apramycin, bluensomycin, netromycin,

streptomycin, tobramycin, sisomicin, destomycin, Antibiotic A-396-I, dibekacin, kasugamycin, fortimicin, or derivative or analog or variants thereof.

17. The method of any of claims 11-12, wherein the drug is a platinum-containing antineoplastic agent selected from cis-diaminedichloroplatinum(II) (cisplatin), trans-diaminedichloroplatinum(II), cis-diamine-diaquaplatinum(II)-ion, chloro(diethylenetriamine)-platinum(II) chloride, dichloro(ethylene-diamine)-platinum(II), diamine(1,1-cyclobutanedi-carboxylato)-platinum(II), spiroplatin, dichlorotrans-dihydroxybisisopropolamine platinum IV (iproplatin), diamine(2-ethylmalonato)-platinum(II), ethylenediamine-malonatoplatinum(II), aqua(1,2-diaminodyclohexane)-sulfatoplatinum(II), (1,2-diaminocyclohexane)malonato-platinum(II), (4-carboxyphthalato)(1,2-diaminocyclo-hexane)-platinum(II), (1,2-diaminocyclohexane)-(isocitrato)platinum(II), (1,2-diaminocyclohexane)-cis(pyruvato)platinum(II), or (1,2-diaminocyclohexane)-oxalatoplatinum(II).

18. A method to prevent, reduce, or otherwise treat hearing impairment due to NIHL, comprising administering a therapeutically effective amount of a compound represented by formula I:

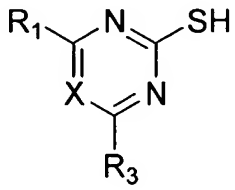


Formula I

wherein, as valence and stability permit,

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

19. A method to prevent, reduce, or otherwise treat hearing impairment due to NIHL, comprising administering a therapeutically effective amount of a compound represented by formula II:



Formula II

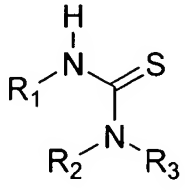
wherein, as valence and stability permit,

X represents C-R_2;

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

20. The method of any of claims 18 or 19, wherein the compound is administered between 72 hours before and 36 hours after an otodestructive noise.

21. A pharmaceutical dosage form comprising a therapeutically effective amount of the compound of represented by formula I:

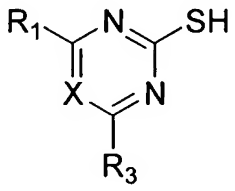


Formula I

wherein, as valence and stability permit,

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

22. A pharmaceutical dosage form comprising a therapeutically effective amount of the compound of represented by formula II:



Formula II

wherein, as valence and stability permit,

X represents C-R_2;

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members.

23. The dosage form of any of claims 21 or 22, wherein said dosage form is a tablet, a capsule, or an oral solution.

24. The dosage form of any of claims 21 or 22, wherein said dosage form is adapted for intravenous infusion, parenteral delivery, or oral delivery.

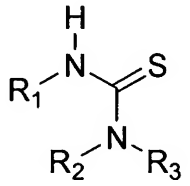
25. The dosage form of any of claims 21 or 22, wherein said therapeutically effective amount of the compound is in the range of about 0.1 mg/kg body weight to about 500 mg/kg body weight.

26. The dosage form of any of claims 21 or 22, wherein said therapeutically effective amount of the compound is in the range of about 1 mg/kg body weight to about 400 mg/kg body weight.

27. The dosage form of any of claims 21 or 22, wherein said therapeutically effective amount of the compound is in the range of about 10 mg/kg body weight to about 100 mg/kg body weight.

28. The dosage form of any of claims 21 or 22, wherein said effective amount of compound is in the range of about 10 mg/kg body weight to about 75 mg/kg body weight.

29. A pharmaceutical formulation comprising a therapeutically effective amount of a compound of formula I:



Formula I

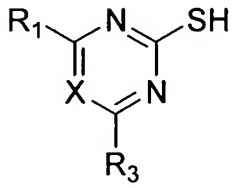
wherein, as valence and stability permit,

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken

together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members;

formulated together with an ototoxic chemotherapeutic agent, either as a preparation or a kit, without diminishing the efficacy of the chemotherapeutic agent.

30. A pharmaceutical formulation, wherein a therapeutically effective amount of a compound represented by formula II:



Formula II

wherein, as valence and stability permit,

X represents C-R_2;

R_1, R_2 and R_3, independently for each occurrence, represent hydrogen, alkyl, alkenyl, alkynyl, alkylthio, imine, amide, cyano, isocyano, carbonyl, carboxyl, carboxamide, alkylsulfonyl, arylsulfonyl, ketone, aldehyde, ester, heteroalkyl, nitrile, amidine, acetal, ketal, substituted or unsubstituted aryl, substituted or unsubstituted heteroaryl, aziridine, carbamate, imide, urea, or thiourea, or R_1 and R_2 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members, or R_2 and R_3 taken together form a substituted or unsubstituted aryl, heteroaryl, carbocyclyl, or heterocyclyl ring having 4 to 8 members;

formulated together with an ototoxic chemotherapeutic agent, either as a preparation or a kit, without diminishing the efficacy of the chemotherapeutic agent.